Products & Services

Cisco Small Form-Factor Pluggable (SFP) Transceiver Modules Maintenance and Troubleshooting

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Introduction

This document provides information about the deployment and troubleshooting of Cisco Small Form-Factor Pluggable (SFP) Transceiver Modules in Cisco Catalyst Switches. Cisco Transceiver Modules support Ethernet, Sonet/SDH and Fibre Channel applications across all Cisco switching and routing platforms. Cisco pluggable transceivers offer a convenient and cost effective solution for the adoption in data centers, campuses, metropolitan area access and ring networks, and storage area networks.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The information in this document is based on the Cisco SFP Transceiver Modules.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Cisco SFP Transceiver Modules

The Cisco portfolio of hot pluggable interfaces offers a rich set of choices in terms of speeds, protocols, reaches and supported transmission media.

Cisco Fast Ethernet SFP Modules

The Cisco 100BASE-X SFP comes in six configurations:

Cisco 100M Ethernet SFP	Part Number	Description
Cisco 100BASE-FX SFP	GLC-FE-100FX	Operates on ordinary multimode fiber-optic (MMF) link spans up to 2 kilometers long. For 100Mbps Ethernet ports
	GLC-GE-100FX	Operates on ordinary multimode fiber-optic (MMF) link spans up to 2 kilometers long. For Gigabit Ethernet ports
Cisco 100BASE-LX10 SFP	GLC-FE-100LX	Operates on ordinary single-mode fiber-optic (SMF) link spans up to 10 kilometers long.
Cisco 100BASE-BX10 SFP	GLC-FE-100BX-D GLC-FE-100BX-U	Operates on ordinary SMF single-strand link spans up to 10 kilometers long.
Cisco 100BASE-EX SFP	GLC-FE-100EX	Operates on ordinary single-mode fiber-optic (SMF) link spans up to 40 kilometers long.
Cisco 100BASE-ZX SFP	GLC-FE-100ZX	Operates on ordinary single-mode fiber-optic (SMF) link spans up to 80 kilometers long.

Cisco Gigabit Ethernet SFP Modules

SFP Transceiver Module [Fiber-Optic LC Connector]

1000BASE-T SFP Transceiver Module [RJ-45 Connector]

Cisco Gigabit Ethernet SFP	Part Number	Description
Cisco 1000BASE-SX SFP	GLC-SX-MM[1] SFP-GE-S[2]	Operates on 50 µm multimode fiber links up to 550 m and on 62.5 µm FDDI-grade multimode fibers up to 220 m.
Cisco 1000BASE-LX/LH SFP	GLC-LH-SM[1] SFP-GE-L[2]	Operates on standard single-mode fiber-optic link spans of up to 10 km and up to 550 m on any multimode fibers.
Cisco 1000BASE-ZX SFP	GLC-ZX-SM[1] SFP-GE-Z[2]	Operates on standard single-mode fiber-optic link spans of up to approximately 70 km in length.
		Operates on a single strand of

Cisco 1000BASE-BX10-D & 1000BASE-BX10-U SFP	GLC-BX-D[2] GLC-BX-U[2]	standard single-mode fiber. A 1000BASE-BX10-D device is always connected to a 1000BASE-BX10-U device with a single strand of standard single-mode fiber with an operating transmission range up to 10 km.
Cisco 1000BASE-T SFP	GLC-T SFP-GE-T[3]	1000BASE-T SFP Transceiver Module for Category 5 copper wire.

[1]Without Digital Optical Monitoring (DOM)

[2]With Digital Optical Monitoring (DOM)

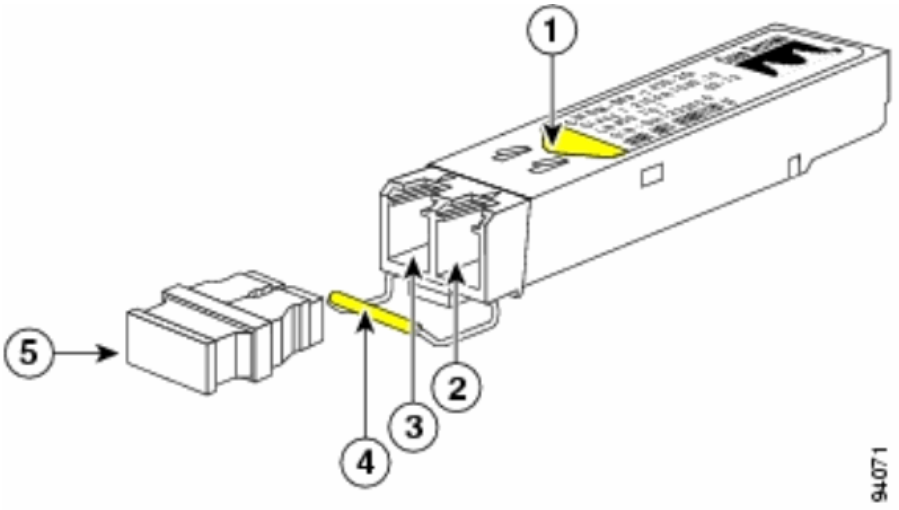
[3] NEBS 3 ESD

For more information about support for Gigabit Ethernet installations on links of multimode fibers, refer to Cisco Support for Gigabit Ethernet Deployments with Multimode Fiber Links up to 2 km.

Cisco CWDM Transceiver Modules

A Cisco Coarse Wavelength Divison Multiplexing (CWDM) SFP is a hot-swappable input/output device that plugs into an SFP port or slot of a Cisco switch or router, and links the port with the fiber-optic network. The Cisco CWDM SFPs are multirate parts that support both Gigabit Ethernet and Fibre Channel (1 Gigabit and 2 Gigabit).

CWDM SFP Module [Yellow-coded CWDM-SFP-1550 shown]



S. No.	Description
1	Color arrow on label
2	Receive optical bore
3	Transmit optical bore
4	Color coded bale clasp
5	Optical bore dust plug

CWDM SFPs come in eight wavelengths that range from 1470 nm to 1610nm. Color markings on the devices identify the wavelength to which the Gigabit Ethernet channel is mapped. This table lists the SFPs with their wavelength and color codes.

Part Number	Description	Color Code
CWDM-SFP-	Cisco CWDM 1470-nm SFP; Gigabit Ethernet and 1 and 2	Gray

1470	Gb Fibre Channel	
CWDM-SFP-1490	Cisco CWDM 1490-nm SFP; Gigabit Ethernet and 1 and 2 Gb Fibre Channel	Violet
CWDM-SFP-1510	Cisco CWDM 1510-nm SFP; Gigabit Ethernet and 1 and 2 Gb Fibre Channel	Blue
CWDM-SFP-1530	Cisco CWDM 1530-nm SFP; Gigabit Ethernet and 1 and 2 Gb Fibre Channel	Green
CWDM-SFP-1550	Cisco CWDM 1550-nm SFP; Gigabit Ethernet and 1 and 2 Gb Fibre Channel	Yellow
CWDM-SFP-1570	Cisco CWDM 1570-nm SFP; Gigabit Ethernet and 1 and 2 Gb Fibre Channel	Orange
CWDM-SFP-1590	Cisco CWDM 1590-nm SFP; Gigabit Ethernet and 1 and 2 Gb Fibre Channel	Red
CWDM-SFP-1610	Cisco CWDM 1610-nm SFP; Gigabit Ethernet and 1 and 2 Gb Fibre Channel	Brown

Supported Catalyst Switches

This section lists the Cisco Catalyst Switches that support the Cisco SFP Transceiver Modules.

Note: If a module / device supports both 100M SFP and Gigabit Ethernet SFP transceiver modules, they can be used at the same time on appropriate ports. However, aggregating (channelling) different types of transceiver modules is not supported.

Catalyst 6500/6000 Series

Modules	100M SFPs	Gigabit Ethernet SFPs	CWDM SFPs
WS-X6148-FE-SFP	GLC-FE-100FX GLC-FE-100LX GLC-FE-100BX-D GLC-FE-100BX-U GLC-FE-100EX GLC-FE-100ZX	-	-
WS-SUP720 WS-SUP32-8GE-3B WS-SUP32-10GE-3B WS-X6724-SFP WS-X6748-SFP	-	GLC-T GLC-SX-MM GLC-LH-SM GLC-ZX-SM GLC-BX-D GLC-BX-U	All CWDM SFPs

Catalyst 4500 Series

Modules	100M SFPs	Gigabit Ethernet SFPs	CWDM SFPs
WS-X4248-FE-SFP	GLC-FE-100FX GLC-FE-100LX GLC-FE-100BX-D GLC-FE-100BX-U	-	-
WS-X4013+TS WS-X4506-GB-T [4] WS-X4516-10GE	-	GLC-SX-MM GLC-LH-SM GLC-ZX-SM GLC-BX-D GLC-BX-U	All CWDM SFPs

WS-X4013+10GE	-	GLC-LH-SM GLC-ZX-SM GLC-BX-D GLC-BX-U	All CWDM SFPs
WS-4448-GB-SFP	-	GLC-T GLC-SX-MM GLC-LH-SM GLC-ZX-SM GLC-BX-D GLC-BX-U	-
WS-X45-Sup6-E	-	GLC-T GLC-SX-MM GLC-LH-SM GLC-ZX-SM	All CWDM SFPs

Catalyst 3750 Series

Switches	100M SFPs	Gigabit Ethernet SFPs	CWDM SFPs
WS-C3750-24PS WS-C3750-24TS WS-C3750-48PS WS-C3750-48TS WS-C3750-24FS-S WS-C3750G-12S WS-C3750G-24PS WS-C3750G-24TS WS-C3750G-48PS WS-C3750G-48TS WS-C3750G-24TS-E1U WS-C3750G-24TS-S1U	GLC-GE-100FX	GLC-T GLC-SX-MM GLC-LH-SM GLC-ZX-SM GLC-BX-D GLC-BX-U	All CWDM SFPs

Catalyst 3750-E Series

Switches	100M SFPs	Gigabit Ethernet SFPs	CWDM SFPs
WS-C3750E-24TD WS-C3750E-24PD WS-C3750E-48TD WS-C3750E-48PD WS-C3750E-48PD-F	GLC-GE-100FX	GLC-T GLC-SX-MM GLC-LH-SM GLC-ZX-SM GLC-BX-D GLC-BX-U	All CWDM SFPs

Catalyst 3560 Series

Switches	100M SFPs	Gigabit Ethernet SFPs	CWDM SFPs
WS-C3560-8PC	GLC-FE-100FX GLC-FE-100LX GLC-FE-100BX-D GLC-FE-100BX-U	GLC-SX-MM GLC-LH-SM GLC-ZX-SM GLC-BX-D GLC-BX-U	All CWDM SFPs
WS-C3560-24PS WS-C3560-48PS WS-C3560-24TS WS-C3560-48TS WS-C3560G-24PS WS-C3560G-24TS WS-C3560G-48PS WS-C3560G-48TS	GLC-GE-100FX	GLC-T GLC-SX-MM GLC-LH-SM GLC-ZX-SM GLC-BX-D GLC-BX-U	All CWDM SFPs

Catalyst 3560-E Series

Switches	100M SFPs	Gigabit Ethernet SFPs	CWDM SFPs
WS-C3560E-24TD WS-C3560E-24PD	GLC-	GLC-T GLC-SX-MM GLC-LH-SM	All

WS-C3560E-48TD WS-C3560E-48PD WS-C3560E-48PD-F	GE-100FX	GLC-ZX-SM GLC-BX-D GLC-BX-U	CWDM SFPs

Catalyst 2970 Series

Switches	100M SFPs	Gigabit Ethernet SFPs	CWDM SFPs
WS-C2970G-24TS	GLC-GE-100FX	GLC-T GLC-SX-MM GLC-LH-SM GLC-ZX-SM	All CWDM SFPs

Catalyst 2960 Series

Switches	100M SFPs	Gigabit Ethernet SFPs	CWDM SFPs
WS-C2960-24TC-L WS-C2960-48TC-L WS-C2960G-24TC-L	GLC-GE-100FX GLC-FE-100FX GLC-FE-100LX GLC-FE-100BX-D GLC-FE-100BX-U	GLC-SX-MM GLC-LH-SM GLC-ZX-SM GLC-BX-D GLC-BX-U	All CWDM SFPs

Catalyst 2950 Series

Switches	100M SFPs	Gigabit Ethernet SFPs	CWDM SFPs
WS-C2950ST-8 LRE WS-C2950ST-24 LRE WS-C2950ST-24 LRE997	-	GLC-T GLC-SX-MM GLC-LH-SM GLC-ZX-SM	All CWDM SFPs

Catalyst 2948G Series

Switches	100M SFPs	Gigabit Ethernet SFPs	CWDM SFPs
WS-C2948G-GE-TX	-	GLC-T GLC-SX-MM GLC-LH-SM GLC-ZX-SM	All CWDM SFPs

Catalyst 2940 Series

Switches	100M SFPs	Gigabit Ethernet SFPs	CWDM SFPs
WS-C2940-8TF-S	-	GLC-T GLC-SX-MM GLC-LH-SM GLC-ZX-SM	-

Catalyst Express 500 Series

Switches	100M SFPs	Gigabit Ethernet SFPs	CWDM SFPs
WS-CE500-24LC WS-CE500-24PC WS-CE500G-12TC	GLC-GE-100FX GLC-FE-100FX GLC-FE-100LX GLC-FE-100BX-D GLC-FE-100BX-U	GLC-SX-MM GLC-LH-SM GLC-ZX-SM	-

Refer to these documents for other types of devices which support Cisco SFP Transceiver Modules:

- Cisco 100-Megabit Ethernet SFP Modules Compatibility Matrix
- Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix

- Cisco Wavelength Division Multiplexing Transceivers Compatibility Matrix

Safety Guidelines

Laser Safety

Before you install SFP modules in a Cisco device or attempt to operate or service a Cisco device equipped with SFP modules, you must read and observe the important safety information in this publication. Refer to the *Regulatory Compliance and Safety Information* publication or the *Site Preparation and Safety Guide* that supports your Cisco device for the complete list of translated safety warnings and agency approvals that apply to your Cisco device.

The Cisco SFP Transceiver Modules are equipped with a Class 1 Laser, which emits invisible radiation. Do not stare into open optical ports. These warnings apply to the Cisco SFP modules.

Warning: Class 1 laser product.

Warning: Because invisible laser radiation can be emitted from the aperture of the port when no fiber is connected, avoid exposure to laser radiation and do not stare into open apertures.

Warning: Laser radiation is present when the system is open and interlocks bypassed.

Warning: Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

Guidelines for Handling SFPs

Use these guidelines when you work with SFPs:

- Cisco SFP modules are static sensitive. Wear an ESD-preventive wrist strap that is connected to the chassis in order to prevent ESD damage.
- Cisco SFP modules are dust sensitive. Always store the devices with plugs installed in the optical bores.
- Do not remove and insert a Cisco SFP module more often than is necessary. Repeated romovals and insertions of a Cisco SFP module can shorten its useful life.

Required Tools

You need these tools in order to install or remove the SFP transceiver:

- Wrist strap or other personal grounding device to prevent ESD occurrences.
- Antistatic mat or antistatic foam to set the transceiver on.
- Fiber-optic end-face cleaning tools and inspection equipment.

  Refer to these documents for complete information on how to inspect and clean fiber-optic connections:

  - Inspection and Cleaning Procedures for Fiber-Optic Connections
  - Compressed Air Cleaning Issues for Fiber-Optic Connections

Install and Remove SFP Transceiver Modules

This installation section provides the installation instructions for the Cisco SFP Transceiver Modules. The SFP Transceiver Modules are hot-swappable input/output (I/O) devices that plug into 100BASE and 1000BASE ports, which connects the module port with the fiber-optic or copper network.

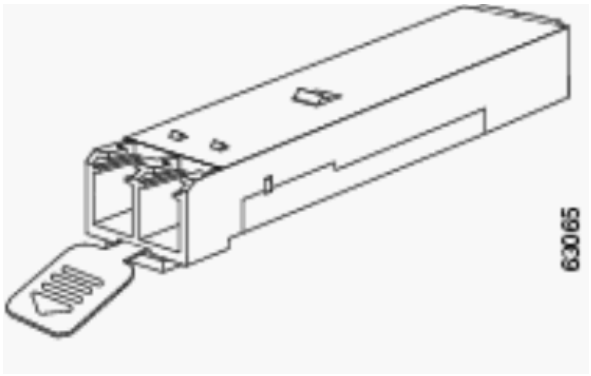
You can use any combination of SFP modules that your Cisco device supports. The only restrictions are each port must match the wavelength specifications on the other end of the cable and the cable must not exceed the stipulated cable length for reliable communications.

Note: See the Safety Guidelines section before you install the SFP Transceiver Modules.

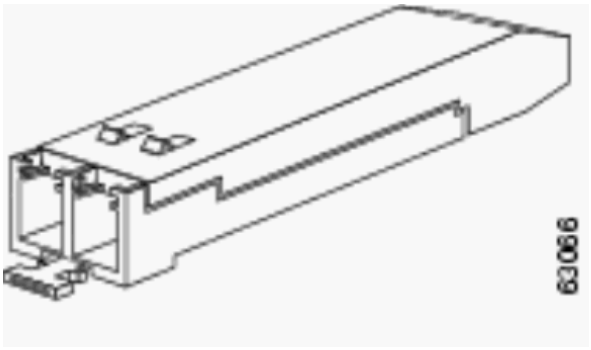
Types of SFP Transceiver Latches

SFP Transceiver Modules can have three types of latching devices to secure an SFP transceiver in a port socket. Determine which type of latch your SFP transceiver uses before you complete the installation and removal procedures:

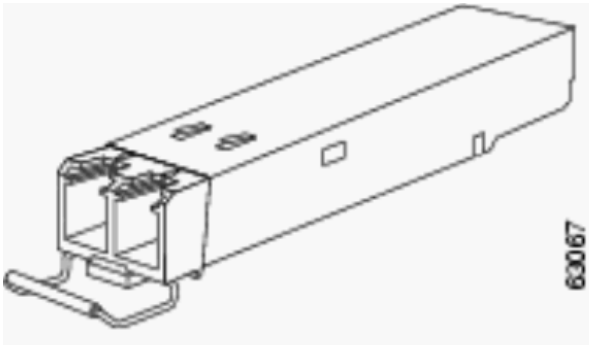
- SFP transceiver with a Mylar tab latch.



- SFP transceiver with an actuator button latch.



- SFP transceiver that has a bale-clasp latch.



Install a SFP Transceiver Module

Complete these steps in order to install a SFP transceiver:

1. Attach an ESD-preventive wrist strap to your wrist and to the ESD ground connector or a bare metal surface on your chassis.

2. Remove the SFP Transceiver Module from its protective packaging.

   Note: Do not remove the optical bore dust plugs until directed to do so later in the procedure.

3. Check the label on the SFP transceiver body to verify that you have the correct model for your network.

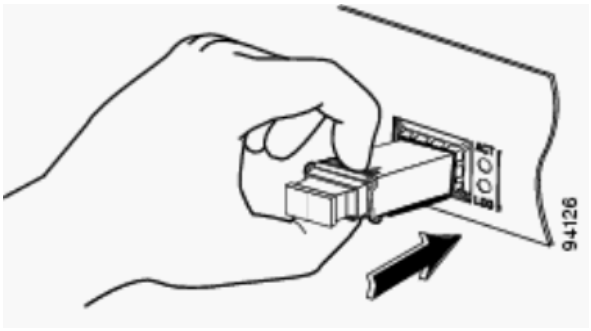
4. Find the send (TX) and receive (RX) markings that identify the top side of the SFP transceiver.

   Note: On some SFP transceivers, the TX and RX marking might be replaced by arrowheads that point from the SFP transceiver connector (transmit direction or TX) and toward the connector (receive direction or RX).

5. Position the SFP transceiver in front of the socket opening.

   Note: Different Cisco devices have different SFP module socket configurations. Your Cisco device could have either a latch-up or a latch-down orientation. Ensure that you are installing the SFP transceiver in the correct orientation for your Cisco device. Refer to the hardware installation instructions that came with your Cisco device for more details.

6. Insert the SFP transceiver into the socket until you feel the SFP Transceiver Module connector snap into place in the socket connector.



   Note: For optical SFP transceivers, before you remove the dust plugs and make any optical connections, observe these guidelines:

   - Always keep the protective dust plugs on the unplugged fiber-optic cable connectors and the transceiver optical bores until you are ready to make a connection.
   - Always inspect and clean the LC connector end-faces just before you make any connections. See the Required Tools section of this document for more information.
   - Always grasp the LC connector housing to plug or unplug a fiber-optic cable.

7. Remove the dust plugs from the network interface cable LC connectors. Save the dust plugs for future use.

8. Remove the dust plugs from the SFP transceiver optical bores.

9. Immediately attach the network interface cable LC connector to the SFP transceiver.

10. Connect the 1000BASE-T SFP transceivers to a copper network.

    Caution: In order to comply with GR-1089 intrabuilding lightning immunity requirements, you must use grounded, shielded, twisted-pair Category 5 cabling.

    Complete these steps in order to connect the transceivers to a copper network:

    a. Insert the Category 5 network cable RJ-45 connector into the SFP transceiver RJ-45 connector.

       When you connect to a 1000BASE-T-compatible server, workstation, or router, use four twisted-pair, straight-through Category 5 cabling for the SFP transceiver port. When you connect to a 1000BASE-T-compatible switch or repeater, use four twisted-pair, crossover Category 5 cabling.

    b. Insert the other end of the network cable into an RJ-45 connector on a 1000BASE-T-compatible target device.

11. Observe the port status LED:

- The LED turns green when the SFP transceiver and the target device have an established link.
- The LED turns amber while STP discovers the network topology and searches for loops. This process takes about 30 seconds, and then the LED turns green.
- If the LED is off, the target device might not be turned on, there might be a cable problem, or there might be a problem with the adapter installed in the target device. Refer to the Troubleshooting section of your switch hardware guide for solutions to cabling problems.
- Reconfigure and reboot the target device if necessary.

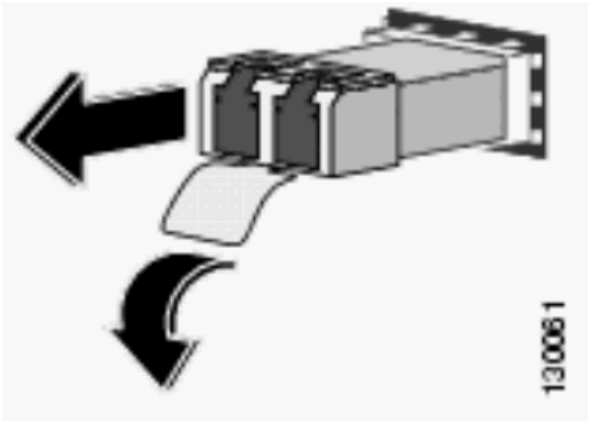
Remove SFP Transceiver Modules

Complete these steps in order to remove the SFP transceiver:

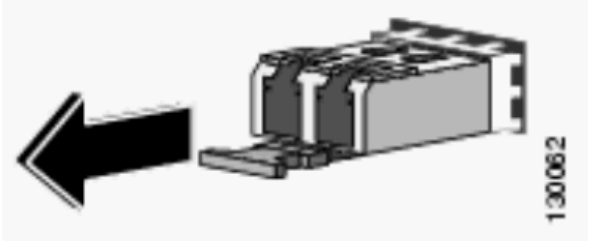
1. Attach an ESD-preventive wrist strap to your wrist and to the ESD ground connector or a bare metal surface on your chassis.
2. Disconnect the network fiber-optic cable or network copper cable from the SFP Transceiver Module connector.

   For optical SFP transceivers, immediately reinstall the dust plugs in the SFP transceiver optical bores and the fiber-optic cable LC connectors.

   Tip: For reattachment of fiber-optic cables, note which connector plug is send (TX) and which is receive (RX).
3. Release and remove the SFP Transceiver Module from the socket connector.
   - If the SFP transceiver has a **Mylar tab latch**, pull the tab gently in a slightly downward direction until the transceiver disengages from the socket connector, and then pull the SFP transceiver straight out. Do not twist or pull the Mylar tab because you could detach it from the SFP transceiver.

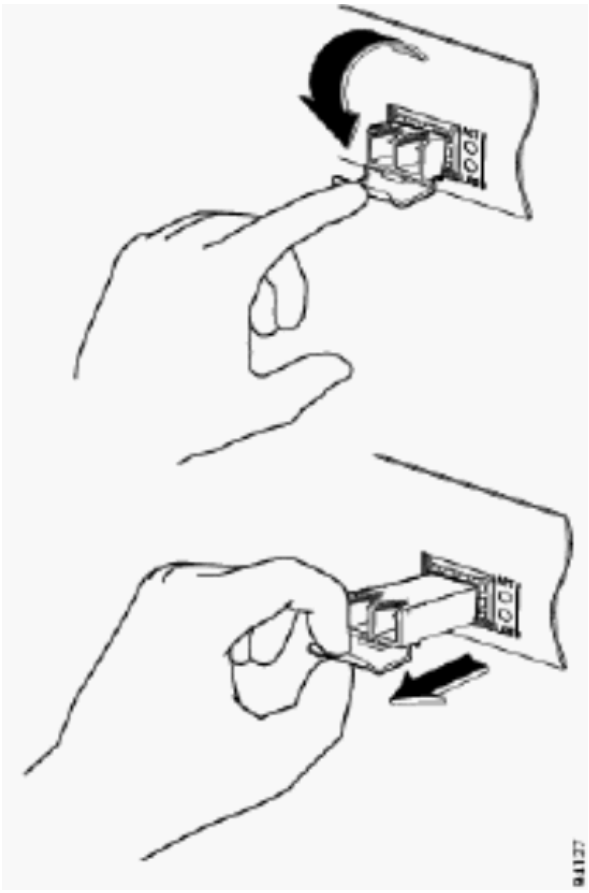
     

   - If the SFP transceiver has an **Actuator button latch**, gently press the actuator button on the front of the SFP transceiver until it clicks and the latch mechanism releases the SFP transceiver from the socket connector. Grasp the actuator button between your thumb and index finger, and carefully pull the SFP transceiver straight from the module slot.

   - If the SFP transceiver has a **Bale-clasp latch**, pull the bale out and down to eject the SFP transceiver from the socket connector. If the bale-clasp latch is obstructed and you cannot use your index finger to open it, use a small flat-blade screwdriver or another long narrow instrument to open the bale-clasp latch. Grasp the SFP transceiver between your thumb and

index finger, and carefully remove it from the socket.



4. Place the removed SFP transceiver in an antistatic bag or other protective environment.

Cabling Specfications

This table shows cabling specifications for the Cisco SFP transceivers installed on a FastEthernet / Gigabit Ethernet SFP port. Note that all SFP ports have LC-type connectors, and the minimum cable distance for all SFPs listed (MMF and SMF [G.652] is 2 meters [6.5 feet]).

SFP	Wavelength (nm)	Fiber Type	Cable Length
GLC-FE-100FX	1310	MMF	2 km (6562 ft)
GLC-GE-100FX	1300	MMF	2 km (6562 ft)
GLC-FE-100LX	1310	SMF	10 km (32,810 ft)
GLC-FE-100BX-U	1310	SMF	10 km (32,810 ft)
GLC-FE-100BX-D	1550	SMF	10 km (32,810 ft)
GLC-FE-100EX	1310	SMF	40 km (131,240 ft)
GLC-FE-100ZX	1550	SMF	80 km (262,480 ft)
1000BASE-SX	850	MMF	From 220 m (722 ft) to 550 m (1,804 ft)
1000BASE-LX/LH	1300	MMF	550 m (1,804 ft)
		SMF	10 km (32,8210 ft)

1000BASE-ZX	1550	SMF	Approximately 70 km, which depends on link loss
1000BASE-BX-D	1310	SMF	10 km (32,8210 ft)
1000BASE-BX-U	1490	SMF	10 km (32,8210 ft)

Configure SFPs

Configure Interface Speed and Duplex Mode

Ethernet interfaces on the switch operate at 10, 100, or 1000 Mbps, or 10,000 Mbps and in either full- or half-duplex mode. In full-duplex mode, two stations can send and receive traffic at the same time. Normally, 10-Mbps ports operate in half-duplex mode, which means that stations can either receive or send traffic.

You cannot configure speed on SFP module ports, but you can configure speed to not negotiate (**nonegotiate**) if connected to a device that does not support autonegotiation. However, when a 1000BASE-T SFP module is in the SFP module port, you can configure speed as 10, 100, or 1000 Mbps, or auto.

You cannot configure duplex mode on SFP module ports unless a 1000BASE-T SFP module or a 100BASE-FX MMF SFP module is in the port. All other SFP modules operate only in full-duplex mode.

- When a 1000BASE-T SFP module is in the SFP module port, you can configure duplex mode to **auto** or **full**.
- When a 100BASE-FX SFP module is in the SFP module port, you can configure duplex mode to **half** or **full**.

Note: Half-duplex mode is supported on Gigabit Ethernet interfaces. However, you cannot configure these interfaces to operate in half-duplex mode.

In order to display the information about an optical transceiver installed, use this command: **show hw-module subslot** *slot/subslot* **transceiver** *port* **idprom**.

Use Third Party SFP Modules

The use of third party SFP transceivers with Cisco devices is not supported by Cisco. Cisco-approved SFP modules have a serial EEPROM that contains the module serial number, the vendor name and ID, a unique security code, and cyclic redundancy check (CRC). When an SFP module is inserted in the switch, the switch software reads the EEPROM to verify the serial number, vendor name and vendor ID, and recomputes the security code and CRC. If the serial number, the vendor name or vendor ID, the security code, or CRC is invalid, the software generates this security error message and places the interface in an error-disabled state:

```
SYS-3-TRANSCEIVER_NOTAPPROVED:Transceiver on port [dec]/[dec] is not supported
```

Connect a SFP Module to a GBIC Module

The SFP and GBIC is just a connection between the actual laser and the chassis. You need to verify these in order to connect a SFP module with a GBIC module:

- The type of fiber optic cable used: Single Mode or Multi Mode.
- The type of physical connection required: SC connector, ST connector, etc.

Troubleshoot SFPs

The Link Does Not Come Up in the Sup720 Module with Line Cards WS-X6724-SFP and WS-X6748-SFP, Even After a Reboot

This issue is due to an Online Insertion and Removal (OIR) or a reboot that caused the port to move into the disabled state. This problem most likely occurs in a Supervisor 720 (Sup720) that runs Catalyst OS (CatOS) versions 8.4(2), 8.4(3) with line cards WS-X6724-SFP and WS-X6748-SFP.

If the port is not in the disabled state before a reboot or OIR, the port remains in operation after the reboot. However, if the port is in diasbled state before or after a reboot, toggle the negotiation state of the port before the remote end is connected. Complete these steps in order to toggle the negotiation of the port:

1. Disable port negotiation on the port.
2. Enable port negotiation on the port to bring the links UP.

The **set port negotiation** command enables or disables the link negotiation protocol on the specified port.

Alternatively, upgrade the software version to Catalyst OS release which is not affected by the Cisco bug ID CSCeh46046 (registered customers only) .

The WS-X6724-SFP Module with DFC3A Resets in Cisco Catalyst 6500 Switches That Run Cisco IOS Software

The WS-X6724-SFP module with Distributed Forwarding Card (DFC3A), that runs Cisco IOS® Software Release 12.2(18)SXE1 reloads unexpectedly due to a memory allocation failure. Before the reload, the available memory in the module is around 200k.

This problem is resolved in Cisco IOS Software Releases 12.2(18)SXE4, 12.2(18)SXF and later.

In order to resolve this problem, upgrade the Cisco IOS Software on the switch to the latest maintenance release, which can be downloaded from the Software Download (registered customers only) page.

Speeds Supported by the 1000BASE-T(GLC-T) SFP Module on the Cisco Catalyst 3750 Series Switch

The 1000BASE-T SFP can support 10/100/1000 speeds only on the Cisco Catalyst 2970, 3560, and 3750 Series Switches.

It is also possible to have the port auto-negotiate at a lower speed, or force a slower speed. Issue the **show interface capabilities** command in order to confirm whether a given GLC-T supports 10/100 speed on a switch.

Output from the **show interface capabilities** command can confirm whether a GLC-T can be run at a lower speed. The output also displays the capabilities of the specified interface, which includes the configurable features and options.

For example, issue this command in order to hardcode the speed of the SFP port to 100Mbps:

```
Switch(config-if)#speed 100
```

Use the 10-Gigabit Ethernet and Gigabit Ethernet SFP Ports of a SupII+10GE or SupV-10GE in a Catalyst 4500 Series Switch

Catalyst 4500 Supervisor II Plus 10GE (WS-X4013+10GE) or Supervisor V 10GE (WS-X4516-10GE) has four GE uplink interfaces and two 10 GE uplink interface per supervisor. The tables in this section illustrate how the uplink provides redundancy in a 4507R or 4510R Chassis in various combinations of the two supervisors in the supervisor slots.

In Cisco IOS Software Release 12.2(25)SG and later on a Catalyst 4507R Series Switch, 10GE and GE uplinks are concurrently usable on the Supervisor Engine V-10GE (WS-X4516-10GE) and the Supervisor Engine II+10GE (WS-4013+10GE). In Cisco IOS Software Releases earlier than 12.2(25)SG, you need to issue the **hw-module uplink select** configuration command to select either the 10GE or GE uplinks.

In Cisco IOS Software Release 12.2(25)SG and later, when you use a Supervisor Engine V-10GE (WS-X4516-10GE) on a Catalyst 4510R Series Switch, you can select to use both the 10GE and GE uplinks concurrently, but only with a WS-X4302-GB in slot 10. If either the 10GE or GE uplinks are selected, then any line card is allowed in slot 10. Issue the **hw-module uplink select** configuration command to select the uplinks. In Cisco IOS Software Releases earlier than 12.2(25)SG, you cannot use the 10GE and GE uplinks concurrently.

Note: Redundancy requires that both supervisor engines in the chassis are of the same supervisor engine model, and to use the same Cisco IOS software image.

If only 10GE ports are selected for uplink:

Uplink Interface	Slot 1: Supervisor II Plus 10GE or V 10 GE Slot 2: Empty	Slot 1:Empty Slot2: Supervisor II Plus 10GE or V 10 GE	Slot1: Supervisor II Plus 10GE or V 10 GE Slot2: Supervisor II Plus 10GE or V 10 GE

10GE 1/1	**Active**	N/A	**Active**
10GE 1/2	**Active**	N/A	Not Active
10GE 2/1	N/A	**Active**	**Active**
10GE 2/2	N/A	**Active**	Not Active

If only GE ports are selected for uplink:

Uplink Interface	Slot 1: Supervisor II Plus 10GE or V 10 GE Slot 2: Empty	Slot 1:Empty Slot2: Supervisor II Plus 10GE or V 10 GE	Slot1: Supervisor II Plus 10GE or V 10 GE Slot2: Supervisor II Plus 10GE or V 10 GE
GE 1/3	**Active**	N/A	**Active**
GE 1/4	**Active**	N/A	**Active**
GE 1/5	**Active**	N/A	Not Active
GE 1/6	**Active**	N/A	Not Active
GE 2/3	N/A	**Active**	**Active**
GE 2/4	N/A	**Active**	**Active**
GE 2/5	N/A	**Active**	Not Active
GE 2/6	N/A	**Active**	Not Active

If both 10GE and GE ports are selected for uplink:

Uplink Interface	Slot 1: Supervisor II Plus 10GE or V 10 GE Slot 2: Empty	Slot 1:Empty Slot2: Supervisor II Plus 10GE or V 10 GE	Slot1: Supervisor II Plus 10GE or V 10 GE Slot2: Supervisor II Plus 10GE or V 10 GE
10GE 1/1	**Active**	N/A	**Active**
10GE 1/2	**Active**	N/A	Not Active
10GE 2/1	N/A	**Active**	**Active**
10GE 2/2	N/A	**Active**	Not Active
GE 1/3	**Active**	N/A	**Active**
GE 1/4	**Active**	N/A	**Active**
GE 1/5	**Active**	N/A	Not Active
GE 1/6	**Active**	N/A	Not Active
GE 2/3	N/A	**Active**	**Active**
GE 2/4	N/A	**Active**	**Active**
GE 2/5	N/A	**Active**	Not Active
GE 2/6	N/A	**Active**	Not Active

Issue these commands in order to enable the 10-Gigabit Ethernet and/or the Gigabit Ethernet SFP uplink ports:

```
Switch#conf t
Switch(config)#hw-module uplink select {tengigabitethernet|gigabitethernet|all}
```

Refer to the Deploying 10-Gigabit Ethernet and a Gigabit Ethernet SFP Ports section of the Catalyst 4500 Series Switch Cisco IOS Software Configuration Guide for more information.

SPF Ports of the WS-X4506-GB-T Module or the WS-X4948 Chassis Do Not Come Up

The WS-X4506-GB-T module has six ports. These ports are dual-mode capable ports. Each port has one RJ45 based 10/100/1000 Mbps connector and one SFP connector. At a given time, only one of these

connectors can be active for a port and the active connector is determined by the **interface** configuration command **media-type {***rj45* **|** *sfp***}**.

WS-X4506-GB-T

In a WS-X4948 chassis, the last four ports (ports 45 to 48) are dual-mode capable.

```
Switch(config)#interface gigabitethernet 5/5

Switch(config-if)#media-type rj45
```

Enter the **show interface capabilities** command in order to provide the *Multiple Media Types* field, which displays the value **no** if a port is not dual-mode capable and lists the media types (**sfp** and **rj45**) for dual-mode capable ports.

SFP Interfaces of X2/Twin Gigabit Converter Do Not Come Up

The default configuration mode is X2, so, if you plan to deploy 10-Gigabit interfaces, you do not need to configure anything. If you want to deploy Gigabit interfaces, that is, TwinGig Convertors, you must configure the associated port-group.

First gather the information on how the X2 slots on a module are grouped. Then, to configure the modes of operation for each X2 port group in which you want to deploy Gigabit, enter the **hw-module module** *m* **port-group** *p* **select gigabitethernet** command. This configuration is preserved across power cycles and reloads.

Refer to Selecting X2/TwinGig Convertor Mode for more information.

The Links Do Not Come Up in Cisco 3800 Series Routers with SPFs for Connecting to Cisco Catalyst Switches

When the SFPs are used to connect a Cisco 3800 Series router to a Cisco Catalyst switch, the link cannot come up, and the **show interface** command shows `down/down`.

In order to overcome this issue, enable autonegotiation on both the router and switch. In order to permanently resolve the issue, upgrade the Cisco IOS software of the router to release 12.4(8) or later, which can be downloaded from Cisco Downloads (registered customers only) . This issue is documented at Cisco bug CSCsc04961 (registered customers only) .

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